REMARKS/ARGUMENTS

The above-identified patent application has been reviewed in light of the Non-Final Office Action dated May 16, 2007. Claim 71 has been amended without intending to abandon or dedicate to the public any patentable subject matter. No claims are cancelled or withdrawn by this paper. Accordingly, Claims 71-85 are currently pending.

The Examiner has rejected Claims 71-73, 77 and 78 under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 6,007,709 to Duyvesteyn et al., ("Duyvesteyn"). The Examiner has also rejected Claims 74-76, 79 and 80-85 under U.S.C. 103 (a) as being unpatenable over Duyvesteyn in view of United States Patent No. 4368112 to Thompson ("Thompson"). As set forth herein, reconsideration and withdrawal of the rejections are respectfully requested.

Applicant's claimed invention

It will be noted that independent Claim 71, as amended, recites:

- a specific feedstock, defined in the claim preamble, which is the underflow tailings, referred to as 'diluted tailings component' ("DTC"), having been derived by:
  - dilution and mixing of bitumen froth with solvent, and
  - separation of the resulting diluted bitumen froth into a diluted bitumen component and the DTC tailings;
- subjecting the DTC tailings to solvent recovery separation to recover substantially all of the solvent as a separate component and produce an underflow 'solvent recovered tailings component' ("SRTC tailings") containing water, solids and residual bitumen and solvent; and
- subjecting the SRTC tailings to gravity separation to produce an overflow stream of clarified heated water for recycle.

So, as required by applicant's claim, the solvent is substantially all removed from the DTC tailings being treated before the resulting SRTC tailings are subjected to gravity separation and the clarified heated water is an overflow product from the gravity separation step.

The sequence of solvent removal before gravity separation has been found to provide an unpredictable consequence. If one gravity separates a bitumen tailings feedstock, which has not had the solvent removed and which contains bitumen, precipitated asphaltenes, solids and water, one will find that the solids / water phase and the overlying dilute bitumen / precipitated asphaltene / water phase, produced by the gravity separation step, do not separate cleanly. Otherwise stated, if the solvent is still present, then it is difficult, if not impossible, to recover clean hot water by gravity settling.

Applicant's invention is partly based on the discovery that, if the solvent is firstly separated from the DTC tailings and the subsequently produced SRTC tailings are then subjected to gravity separation, one finds that a clean water layer is produced that is suitable for recycling. It appears that, by driving off the solvent, the density of the asphaltenes is increased and they tend to subsequently settle quickly and end up with the solids in the gravity separation step.

Furthermore, it should be noted that the sequenced steps of solvent removal initially and gravity separation later result in the clarified heated water being produced as an overflow product from the gravity separation step.

To summarize then, applicant's invention as a whole, as defined by claim 71, involves, at least:

- first separating the solvent from the DTC tailings and producing SRTC tailings; and
- then gravity separating the SRTC tailings to recover clarified heated water as an overflow product, which can be recycled.

And there is a reason, previously apparently unappreciated by those skilled in the art, why the sequence is important: clean hot water suitable for recycling is recovered by gravity separation if the solvent has been earlier removed.

Rejection of Claims 71-73, 77 and 78

The Examiner has rejected claims 71-73, 77 and 78 under 35 U.S.C. 103(a) as being unpatentable over Duyvesteyn. Applicant respectfully traverses the rejection for the reasons now following:

U.S. 6007709 – Duyvesteyn et. al.

As set forth in the Summary section at column 4, lines 29-35, Duyvesteyn teaches:

- treating bitumen froth in a counter-current decantation circuit (wherein the concentration of asphaltenes, circuit water and solids (the 'gangue') is progressively increased and the bitumen is washed from the gangue, through dilution and mixing with increasing concentrations of solvent);
- specifically using a paraffinic hydrocarbon as the solvent; and
- recovering a solvent-diluted bitumen as the desired product.

In the embodiment shown in the Figure and described in the Detailed Description, this is accomplished by Duyvesteyn in the following manner:

- deaerated bitumen froth 12 is mixed in a primary mixer 13 with secondary settler overflow (containing a large proportion of diluted bitumen and solvent) derived from a secondary settler 22 – as a consequence, the solvent in the secondary overflow solvates bitumen in the froth and precipitates out 'dirty' asphaltenes;
- the resulting mixture is then gravity settled in a primary settler 16 to produce a clean, diluted bitumen overflow product and a primary settler underflow;
- the primary settler underflow is recycled to a secondary mixer 19 where it is mixed with overflow from a tertiary settler 27 and the resulting mixture is then gravity settled in a secondary settler 22. In this operation a high solvent/bitumen ratio of 20:1 is maintained, so that a high proportion of the bitumen in the primary settler underflow is dissolved in the solvent;
- the secondary underflow from the secondary settler 22 is then fed into a tertiary mixer 24 wherein it is mixed with fresh solvent to provide a solvent/bitumen ratio of 70:1. This is done with the objective of scrubbing residual bitumen from the secondary underflow by providing a very high concentration of solvent. The tertiary mixer product is then settled in a tertiary settler 27 wherein the diluted bitumen is separated from "the solids phase containing the heaviest and dirtiest asphaltenes, sand, clay, silt,

water, residual bitumen and diluent." This solids phase is the "underflow or residuum, from the tertiary settler 27, now termed bitumen froth tailings 28";

- the bitumen froth tailings 28 are then settled in a primary gravity separation 30 to produce three layers: an overflow very dilute bitumen phase 31; an intermediate, very dilute bitumen/asphaltenes/water phase 32; and an underflow bottom water/solids phase 33;
- the bottom water/solids phase 33 is filtered in filter 43 to produce a solids tails and a water filtrate 4;
- the water filtrate 4 is recycled to the process;
- the intermediate, very dilute bitumen/asphaltenes/water phase 32 from the primary gravity separation 30 is subjected to secondary gravity separation 37 to produce an overflow, very dilute bitumen phase 38 (which is recycled to the primary gravity separation 30), an intermediate solvent/asphaltenes phase 39 and an underflow water phase 40 which is recycled to the process; and
- the intermediate solvent/asphaltenes phase 39 from the secondary gravity separation 37 is subjected to distillation 46 to produce asphaltenes tails and solvent vapour 47 which is condensed and recycled to primary gravity separation.

From the foregoing it will be noted that, in accordance with the Duyvesteyn process:

- The bitumen froth tailings 28 fed to the gravity separation 30 have not been previously subjected to solvent recovery and therefore have a high solvent/bitumen ratio of about 70:1;
- Duyvesteyn et al have a reason for requiring this high solvent/bitumen ration of 70:1 – they want to scrub bitumen from the secondary settler underflow which is recycled in accordance with the multiple stage, countercurrent decantation arrangement which is the core of their process;
- The source of water recycle 4 arises as an underflow from the primary and secondary gravity separations 30, 37; and
- Solvent recovery is only practised at the end of the process on a solvent/precipitated

asphaltenes phase 39, which is a small proportion of the initial feed.

It is important to note that the bulk of the solvent is separated by gravity separation and recycled to the mixer/settler units to maintain the high solvent/bitumen ratios in those units. It is not recovered by distillation. Only the small amount of solvent in phase 39 is recovered by distillation, after gravity separation.

Comment regarding In re Burhans

Applicant notes that the Court stated in the report of the In re Burhans decision:

> "The cited references considered collectively clearly suggest doing the thing that appellant has done in this case and the Primary Examiner and the Board of Appeals correctly decided that the methods and article defined in the appealed claims were not patentable over the art of record for the reason that what appellant has done would be obvious to anyone skilled in the art."

Applicant respectfully submits that there is no motivation, suggestion, teaching or reason in Duyvesteyn et al that the solvent should first be removed from solvent-diluted tailings prior to gravity separation, where an objective is to recover substantially clean water for recycle to the process.

How applicant's amended Claim 71 distinguishes over the Duyvesteyn reference

It will be noted that the applicant's amended independent Claim 71 distinguishes over the disclosure of Duyvesteyn in the following respects:

- the solvent-diluted tailings as a whole are subjected to solvent recovery to separately recover substantially all of the solvent and separately produce a solvent recovered tailings component which contains only residual bitumen and solvent; and
- the solvent recovered tailings component as a whole is subjected to gravity

separation to separately produce an overflow stream of clarified heated water.

In contrast, Duyvesteyn teaches:

- recycling most of the solvent (present in the "very dilute bitumen phase 31") to the primary mixer/settler 13,16;
- recycling most of the residual solvent (present in the "very dilute bitumen phase 38" to the primary gravity separation 30; and
- subjects only the "solvent/ppt. asphaltenes phase 39" to solvent recovery b distillation 46.

Most importantly, the reference fails to teach anything about pre-treating the solvent-diluted tailings with solvent removal to arrive at a substantially solvent-free tailings which, when subsequently settled, yields an overflow stream of clarified water.

Applicant therefore respectfully submits that amended claim 71 clearly and patentably distinguishes over Duyvesteyn and, together with dependent claims 72-73, 77 and 78, should be allowable.

Rejection of Claims 74-76, 79 and 80-85

The Examiner has rejected claims 74-76, 79 and 80-85 under U.S.C. 103 (a) as unpatenable over Duyvesteyn in view of Thompson. Applicant respectfully traverses this rejection for the reasons now following.

Initially, it is noted that if an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). See MPEP §2143.03. Applicant has already addressed the Duyvesteyn et al primary reference and pointed out how amended independent claim 71 is patentably distinct relative thereto. The claims, which have been rejected in paragraph 2, are dependent on claim 71.

U.S. 4368112 – Thompson

The Thompson reference teaches:

- starting with a feed of cold slack wax containing foots oil and a solvent (MEK/MIBK) for the foots oil;
- mixing this feed with permeate solvent;
- warming the mixture to dissolve the foots oil but not the wax;
- filtering the product to separate the solid wax from the foots oil solution;
- washing the filtered wax from the foots oil solution with a solvent comprising MEK/MIBK;
- passing the foots oil and the wash solvent through a plurality of semi-permeable cellulose membranes selected to produce a solvent permeate, lean in foots oil, and a retentate rich in foots oil.

The Thompson process employs ultrafiltration to separate the solvent from the foots oil.

The Examiner points to lines 36-40 in col. 1 wherein it is stated that it is known to treat solvent-containing foots oil in one or more distillation steps to separate the solvent from the oil. The Examiner then asserts that it would therefore be obvious to modify the Duyvesteyn process to recover the solvent by distillation. Applicant acknowledges that distillation is a common technique for separating a lighter hydrocarbon solvent from a heavier oil fraction. However, applicant's dependent claims 74, 75, 79, and 80 recite more than practising distillation in solvent recovery. They involve the additional feature of pumping part of the underflow back into the solvent recovery stage to agitate dilute tailings component therein. This is not an element taught or suggested by the Thompson reference – as the Examiner acknowledges. However, the Examiner asserts that it would be obvious to recycle part of the oil component from the distillation back into the distillation vessel.

Applicant respectfully points out:

- Duyvestyen's distillation step is practised on solvent/pptd. asphaltenes phase

39;

- the solvent is recovered from phase 39, therefore leaving asphaltenes as the residue.

Asphaltenes are the most undesired component in bitumen. This is acknowledged by Duyvesteyn at column 2, lines 64-66 where it is stated:

"Secondly, the naphtha diluent solvates the bitumen as well as the unwanted and dirty asphaltenes..."

It follows that recycling asphaltenes to the gravity separation step would not be something that a person skilled in the art would do. Applicant therefore respectfully submits that the subject matter as a whole, recited by claims 74-76, 79, and 80-85, are patentably distinct from the information provided by the combination of references.

Based upon the foregoing, Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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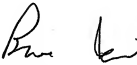
By: 

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